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A morphological typology for the "Kranzhügel" of the Greater Western Jazira and its impact upon interpretations of Early Bronze Age north-eastern Syria

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ABSTRACT

In the poorly-investigated Greater Western Jazira (GWJ) of north-eastern Syria, the most well-known sites are large *tell* settlements often called "Kranzhügel". While this term broadly describes sub-circular mounded sites with two concentric ramparts, it is neither precise nor applicable to all fortified *tells* of the region. Its widespread application across morphologically heterogeneous sites has led to a distortion of concepts of settlement dynamics and human activity in the GWJ during the Early Bronze Age. This paper uses an intensive remote sensing study and results from past fieldwork to disentangle the term "Kranzhügel" from indiscriminate use and lack of academic dissemination, and build a new typology based upon the absolute morphological forms of fortified GWJ sites. This not only provides a framework for researchers in this region, especially when working with remote sensing data, but also a case study of the pitfalls of terminological ambiguity which are present across many areas of archaeological research.

1. Introduction

Archaeological research in Syria, particularly of its north-eastern *Jazira* region, has been numerous and disparate over the last century. Beginning with explorations and site visits in the 1900s, and continuing with surveys and excavations from the 1930s, diverse teams from multiple institutions of various countries have investigated this landscape from an array of perspectives using differing techniques (see Bonatz and Martin, 2013). While this has led to a wealth of data that enables interpretations approaching a holistic view of the region's past, it has also led to contradictions, confusions, and incongruities in the archaeological record due to the oftentimes isolated nature of investigations and their discrete publications in a variety of languages. While practically all projects have taken into account a modicum of each other's research, and the last few decades has seen some intensive partnerships between archaeological missions (e.g. the excavations at Tell Beydar; Pruß, 2013a) and overarching projects attempting to unite disparate datasets (e.g. the Fragile Crescent Project; Lawrence and Wilkinson, 2015; Wilkinson et al., 2014), much work is still required to increase the cohesiveness of understanding of this region's past to a level which would allow for the forming of accurate large-scale interpretations.

This is particularly the case in a region the author has termed the Greater Western Jazira[1] (GWJ) (Smith, 2015a, 2015b, 2020a, 2020b; Fig. 1). This semi-arid to arid steppe region, which today receives between 380 and 140 mm annual precipitation (based on GPCC data; Fig. 2), covers over 27,000 km^2. Its undulating landscape is marked by particularly prominent and distinctive fortified *tell* settlements dating broadly to the 3rd millennium BCE, known in academic literature by the German-language term given to them by the region's first foreign explorers: "Kranzhügel". As this article will discuss in the light of new research using holistic remote sensing and all available surface investigation datasets, this term is both useful and a significant hindrance to the accurate dissemination of the archaeology of this region. A re-examination of multilingual publications and a new typology are therefore required in order to render it usable for the forming of interpretations, especially those made on the basis of remote sensing data, currently a necessary requirement for studies of the regrettably inaccessible Syria.

Indeed, the entire GWJ constitutes a large knowledge gap in the otherwise well-researched archaeology of Northern Mesopotamia,

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[1] The term "Western Jazira" (or "Westgazira"/"westliche Gazira") has long been used to describe the region between the Balikh and the Khabur (e.g. Hempelmann, 2013; Kouchoukos, 1998; Pruß, 2013b), however it has also been used for the region between the Euphrates and the Balikh (Einwag, 1993, 2000). In order to emphasise that the entire Syrian region between the Euphrates and Khabur is being referred to, the new term "Greater Western Jazira" was coined.

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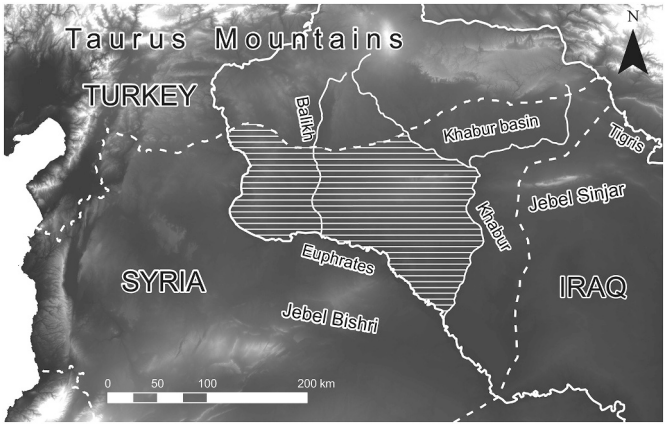

Fig. 1. ASTER elevation map showing the location of the Greater Western Jazira (horizontal line shading) in its regional context. ASTER GDEM is a product of METI and NASA.

where studies have been infrequent, selective, and insufficiently disseminated. It has long been considered a "marginal" area, which, due to its generally low levels of precipitation and location away from river valleys, was long assumed to offer little in the way of archaeological remains (e.g. Bell, 1911: 65; Mallowan, 1946; von Oppenheim, 1900: 1–6). Until the mid-1950s, a time when prototype surveys had already been conducted in the nearby Khabur basin and Balikh valley (Mallowan, 1937, 1946; see Fig. 1), and sites like Tell Brak, Chagar Bazar, and Mari had undergone multiple seasons of excavation (Mallowan, 1937, 1947; Parrot, 1940), the GWJ had hardly even been visited by archaeologists. Despite significant projects having taken place since this time (see Section 2), this delayed commencement of investigation has resulted in a skewed picture of Northern Mesopotamian settlement dynamics, as the GWJ is often either not considered in regional interpretations, or treated exclusively as a separate entity.

More important than this spatial knowledge gap, however, is the lack of interpretation and integration of settlement morphologies of the GWJ's Early Bronze Age (EBA; ca. 3rd millennium BCE), specifically the "Kranzhügel". In part, the relatively low academic profile of these sites can be put down to the paucity of investigation in this region, comprising a mere four excavations and four full-intensity ground surveys. However, the existence of "Kranzhügel" has been known of, and a majority of them mapped, since the travels of the explorer Max von Oppenheim in the 1910s and 1920s (Moortgat-Correns, 1972); indeed they are the best-known (and often the only known) EBA settlements in the region. Rather, the unusual nature of these sites presents a difficulty to most interpretations of a regional scope, which have tended to see the semi-arid and arid steppes as "peripheral" areas, used by large long-term polities located in more fertile regions for pasturelands and perhaps a modicum of agriculture, but basically the domain of nomadic peoples (Lyonnet, 2001, 2009). While this appears a reasonable hypothesis due to the region's low rainfall levels, "Kranzhügel", with their large sizes, massive fortifications and buildings, and appearance of planned architecture (Castel, 2020; Hempelmann, 2013: 271–276, 2020; Meyer, 2010a; Meyer, 2014), fit poorly into such a model. Akkermans and Schwartz (2003: 256–259) recognised this issue as "the *Kranzhügel* problem", an apt description for how much of the academic discourse on Northern Mesopotamia has viewed the existence of these sites. Thus, they often receive brief mention in regional studies, but are rarely given equal consideration.

Despite this, a substantial corpus of knowledge exists about the GWJ and its "Kranzhügel", which shows that it presents a settlement history unique in the regional EBA pattern. To summarise briefly,[2] following a dearth of settled occupation during the latter half of the 4th millennium BCE (Hempelmann, 2013: 271; Meyer, 2010b), the GWJ saw an unprecedented rapid and substantial increase in numbers and extent of settlement during the EBA (from EJZ 0 onwards – refer to Table 1 for

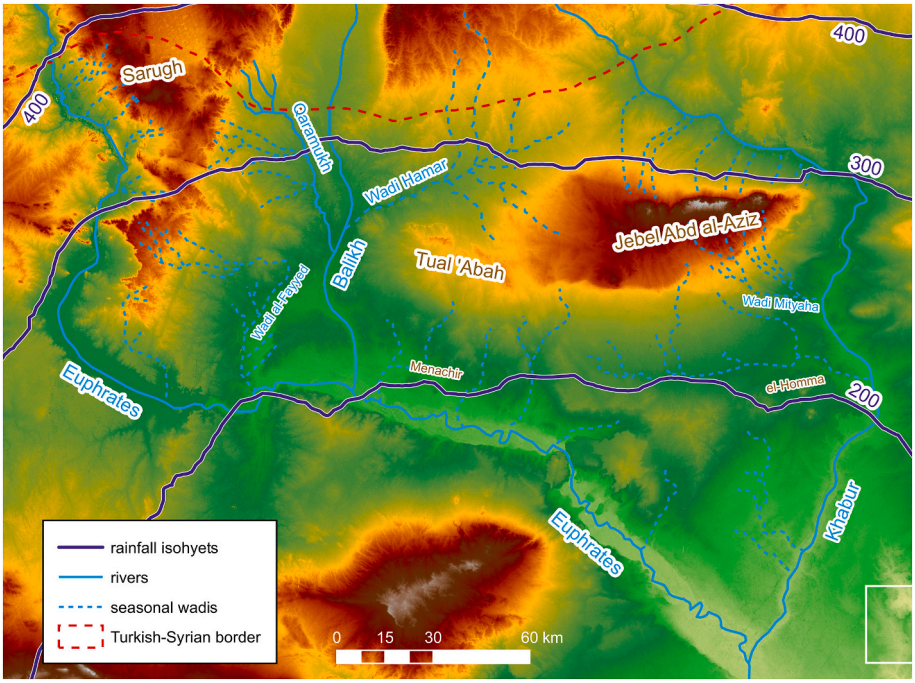

Fig. 2. ASTER map showing the geographical features of the GWJ. Isohyets represent average annual precipitation from 1980 to 2010 from Global Precipitation Climatology Centre (GPCC) data, processed by Louise Rayne, Newcastle University, UK. Seasonal wadis traced from Danti, 2000: Fig. 6.1a; Kouchoukos, 1998: Fig. 7.10; Moortgat-Correns, 1972: Karte II.

[2] See Smith, 2020a for a more detailed overview.

Table 1
ARCANE "Early Jezirah" (EJZ) chronology table (adapted from Lebeau, 2011: Table 1; see also Lebeau and Sakal 2004–2021).

approximate years BC	ARCANE EJZ chronology
3100	
3000	EJZ 0
2900	EJZ 1
2800	
2700	EJZ 2
2600	Final EJZ 2
2500	EJZ 3a
2400	EJZ 3b
2300	EJZ 4a
	EJZ 4b
2200	EJZ 4c
2100	EJZ 5
2000	

periodisation information[3]), with "Kranzhügel" such as Tell Chuera (68 ha) and Tell Mabtuh Sharqi (44 ha) providing the main evidence for flourishing habitation. These sites are so large that "even today, with industrial scale agriculture and support systems, there are no settlements comparable to those of the third millennium [BC]" (Hole, 1997: 52). Yet they were by no means the only kind of settlement during this period, and archaeological surveys have uncovered a plethora of smaller towns, villages, hamlets, forts, farms, and homesteads also (e.g. Danti, 2000: 261–281; Hole and Kouchoukos, 1995; Pruß, 2005). Starting in EJZ 4b, a decline in sedentary habitation, as seemingly sudden as its establishment several centuries earlier, took place, with large and small settlements (including the "Kranzhügel") undergoing the same rapid abandonment (Hempelmann, 2013: 271–276; Meyer, 2010b; Pruß, 2013b). Though there is evidence for some Middle Bronze Age, Late Bronze Age, and Iron Age occupation, this era of little-to-no settlement largely lasted until the Roman/Sassanian period more than two millennia later (Hole and Kouchoukos, 1995).

2. "Kranzhügel" in prior literature and associated issues

The word "Kranzhügel", which literally means "wreath hill" in German,[4] was first coined by von Oppenheim as a descriptor for particular sites he encountered during his travels. In his field journals, he defined them as being circular or polygonal sites each comprising an inner mound enclosed by bastions or an inner wall, surrounded by an encircling lower-level terrace enclosed by a further wall (Moortgat-Correns, 1972: 26). Eight sites fitting this definition were singled out by von Oppenheim – Tells Chuera, Abu Shakhat, Khanzir, Mabtuh Gharbi, Mabtuh Sharqi, al-Magher, Mu'azzar, and Khirbet Malhat (see Fig. 12 for locations). For a long time following his expeditions the term "Kranzhügel" remained confined to German-language literature and mostly referred to these plus a few other sites in the GWJ (specifically, exclusively between the Balikh and Khabur rivers; e.g. Moortgat, 1959; Moortgat-Correns, 1972). This rather arbitrarily imposed geographical constraint limited the recognition of similar settlements beyond this specific area, keeping the "Kranzhügel" definition a relatively narrow one, albeit with often unrecognised sub-divisions (see below). The commencement of regular excavations at Tell Chuera in 1958, continuing until 2011, provided a wealth of well-published detail on one "Kranzhügel" (Meyer, 2010b), but no breadth of data on the site type as a whole.

More recently, the term "Kranzhügel" has been introduced into general archaeological discourse and used to describe a wide range of sites in Northern Mesopotamia. For example, Tell Beydar in the Khabur basin has often been called a "Kranzhügel" since a connection between its apparent morphology on aerial imagery and that of Tell Chuera was made (Lebeau, 1990: 281–283). The term has also been applied to Tell al-Rawda in central western Syria (Casana and Herrmann, 2010), a site that however features many differences to von Oppenheim's definition (Castel and Peltenburg, 2007: 611–612; Helms and Quenet, 2020: 82–84). More tentatively, the site of Mari has been labelled a "Kranzhügel" (Arbuckle and Hammer, 2019; Lyonnet, 2001) despite its variant EBA morphology (Butterlin, 2020) and location far from the GWJ, as well as even more diverse sites such as Tell Musti, Tell al-Rimah (Lyonnet, 2001) and Tell Mozan (Crawford, 2004: 122–134). Evidently, there is a need for clarification and greater precision of the term.

Two major issues exist with the way the term "Kranzhügel" has been used in archaeological literature. The first is the false impression of homogeneity that arises from its indiscriminate application to settlements with a range of morphological, temporal, and cultural variations. In part, this is due to the vagueness of the original term, and the lack of precision in its definition. Largely however, it is due to the paucity of research conducted on these sites, which has led to Tell Chuera being the only well-known example. Thus, a common conception of "Kranzhügel" meaning "sites like Tell Chuera" has skewed the term further, as any number of superficial morphological similarities with Chuera (such as a roughly circular structure, monumental architecture, and a radial street pattern) can be found at a selection of otherwise heterogeneous sites (Creekmore, 2008: 362; Smith et al., 2014: 164–165). Moreover, certain basic accepted definitions of these sites, such as the circular form exemplified by Tell Chuera, do not even apply to all of von Oppenheim's original "Kranzhügel", with Tell Mu'azzar, for example, being pentagonal and Tell al-Magher almost square (Moortgat-Correns, 1972: 30–31).[5]

This is well illustrated by Tell Beydar, which from aerial and satellite imagery certainly bears similarities to Tell Chuera (Fig. 3; Meyer, 2010b). These include a central flat circular mound surrounded by an enclosing wall, beyond which a gap precedes a second clear enclosing wall. However, a more detailed examination shows many differences such as the central mound of Tell Beydar featuring a peak in the centre, as opposed to the depression visible at Tell Chuera (Meyer, 2014). Additionally, the area between the two walls of Tell Beydar is flat, devoid of obvious architecture, and apparently at the same level as the surrounding landscape; starkly contrasted with the undulating surface of the clear terrace of Tell Chuera's lower town (see Fig. 3). Excavation

[3] The EBA periodisations used in this paper are from the "Early Jezirah" (EJZ) chronology defined by Lebeau (2011), part of the ARCANE regional chronology project (Table 1; Lebeau and Sakal 2004–2021). Differing chronologies used by the various archaeological projects in the GWJ were transposed to the EJZ by the author.

[4] It should be noted that, despite the widespread use of the term "Kranzhügeln" in several English-language publications, both the singular and plural nominative form of the noun is "Kranzhügel".

[5] See for example the use of the term "round/circular cities" (Lyonnet, 2009; Meyer, 2014; Castel et al. [eds.] 2020), supposedly a more neutral one than "Kranzhügel" and yet loaded with a morphological descriptor that does not universally apply.

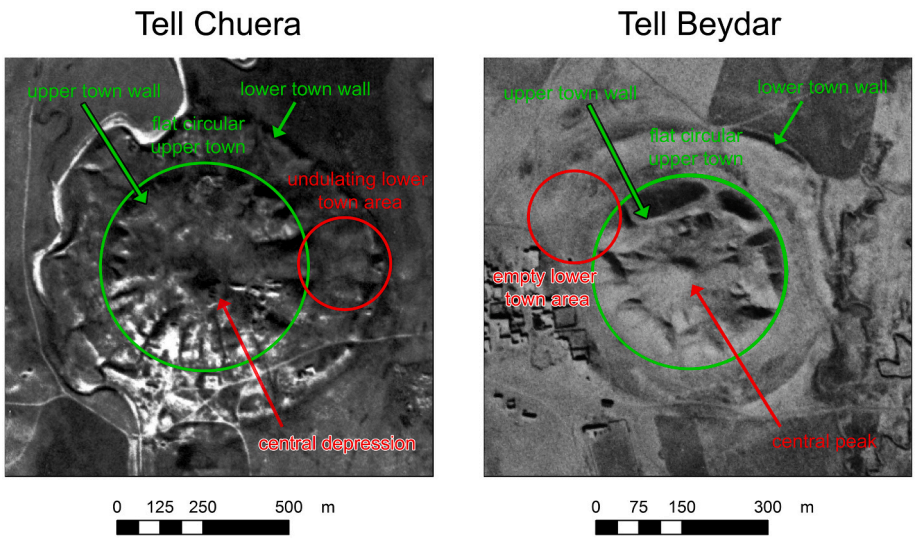

Fig. 3. Comparative CORONA satellite imagery of Tells Chuera and Beydar, with features common to both labelled in green and differing features labelled in red. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

data further confirms these discrepancies, with evidence for Beydar's outer wall being used for burials (i.e. no longer primarily a fortification) and the lower town uninhabited by Final EJZ 2, only a few centuries after initial occupation during EJZ 1 (Bretschneider, 1997; Pruß, 2013a: 134–136). Thus, the continued use of the term "Kranzhügel" to describe Tell Beydar (e.g. Arbuckle and Hammer, 2019) creates a false impression of site type homogeneity with Tell Chuera, something already noted by Meyer (2010b: 22) and Creekmore (2008: 342–343), who perceptively states that "the urban plans at Chuera and Beydar have little in common, and certainly are not more similar to each other than they are to non-*Kranzhügel* sites". Meanwhile, Tell al-Rawda and Mari feature equally, if not more, significant discrepancies with the "Kranzhügel" descriptor (see Castel, 2020 and Butterlin, 2020, respectively).[6]

The second issue with the indiscriminate use of the term "Kranzhügel" is the misconceptions of and variations within the developmental histories of sites to which it is applied. For example, the term "double-walled", or similar phrasings, are often used to describe an apparently integral part of the "Kranzhügel" definition (e.g. Arbuckle and Hammer, 2019: 416–417; Nishimura, 2014: 81; Ristvet, 2015: 55). While two sets of concentric city walls are often the most prominent feature in the appearance of such sites on satellite imagery (see Fig. 3), this is not always the case. For example, several sites with morphologies otherwise very similar to Tell Chuera do not feature a second (outer) city wall (Meyer, 2014; see Section 4.3). Thus, a falsely-assumed homogeneity is again a problem here. However, the issue of the term "double-walled" goes beyond this, for it heavily implies that both walls were in use simultaneously as defensive structures, and hence that the upper and lower towns were inhabited at the same time. This is not consistently the case, however. For example, as detailed above, Tell Beydar was only truly "double-walled" for the first three centuries of its eight-century long EBA occupation. Even the "Kranzhügel" type-site of Tell Chuera began as a single-walled tell in EJZ 0 and only expanded into its lower town five centuries later (in Final EJZ 2 / EJZ 3a), at which point a new (second) outer wall was constructed (Helms and Quenet, 2020: 78–81; Meyer, 2010a, 2014).

These issues clearly require addressing, particularly for any study of the GWJ. Already in the 1950s, van Liere and Lauffray (1955) created a 13-part typology of all sites in the *Jazira*, eight of which relate to fortified tells (*Types I* to *IV*, *a)* and *b)*, respectively); a study that was however largely ignored in subsequent literature (Meyer, 2010b: 15). More recently, this problem has been noted by several authors, including Creekmore (2014), and Rey (2012), and was one of the major topics discussed at the 2013 international workshop "Origins, Structure, Development and Sociology of Circular Cities of Early Bronze Age Syria" held in Lyon (Castel et al., 2020). Taking this into account, a typology of the appearance of "Kranzhügel"-like settlements on remote sensing data can be created for the GWJ – one that is more precise and less constrained by previous assumptions based on that term. However, as the word has become ingrained and synonymous with certain sites such as Tell Chuera, the proposed typology does not attempt to eliminate it, but rather to create a more precise definition, and coin new terms for sites that fall outside this.

3. Materials and methods

As part of the author's PhD research (Smith, 2015a), a remote sensing survey of the entire GWJ was conducted. This consisted of a detailed analysis of satellite imagery (mainly declassified US-military CORONA imagery from the 1960s and 70s [Philip et al., 2002: 112–115]) at its native resolution, latitudinal line by latitudinal line, with Digital Elevation Models from the NASA/JAXA ASTER dataset (Abrams, 2000: 854–858) used as a backup when the imagery was unclear, and maps used for toponym identification. This acquired dataset of over 2000 potential features was then interpreted through the lens of numerous ground truth data, of which those relevant to "Kranzhügel" comprise the traveller's reports of Bell (1911: 65) and von Oppenheim (1943; in Moortgat-Correns 1972), site visits by archaeologists (Kühne, 1983; Kühne and Schneider, 1988; Preuss, 1989; Quenet and Sultan, 2020; Schneider and Daszkiewicz, 2001), excavation reports (Gernez and Souleiman, 2013; Hempelmann, 2013; Meyer, 2010), and survey publications (Córdoba, 1988; Einwag, 1993, 2000; Hempelmann, 2013: 187–193; Kouchoukos, 1998: 317–395; Kudlek, 2006; Pruß, 2005; Quenet and Sultan, 2020). It was during the course of these investigations that it became clear that a categorisation of "Kranzhügel" was necessary for accurate interpretations.

To begin with, the new term "two-tiered fortified tell" was created as a neutral alternative. This focuses solely on the three defining characteristics of this site type:

1) they are integral tells;
2) they are fortified;

[6] This paper focuses solely on aspects of site morphology; for an overview of the equally distinct discrepancies in the material culture of various sites termed "Kranzhügel", see Babour and Mouamar, 2020.

3) they are spread across two height levels of settlement as a result of their constructional developments.

By *integral* tells it is meant that despite their varying developmental histories (see above), they appear as "single" sites on remote sensing data, and do not for example feature lower towns separate from the main mound (unlike e.g. Tell Hamoukar / Khirbet al-Fakhar [Al Quntar et al., 2011]). Key characteristics of the morphologies of each two-tiered fortified tell site were noted during the remote sensing survey, then categories were created from those properties which were found to be both diagnostic and shared by numerous sites. Nevertheless, around 25% of the identified two-tiered fortified tells defied categorisation due to their unique morphologies; thus an "other" category was additionally created.

Two things should be emphasised about this classification system. Firstly, it is primarily meant to be applicable to the GWJ, and while it can also be applied to several sites beyond its borders, it is not specifically designed to be of use across the wider region.[7] Secondly, it is a typology of the appearance of sites on the remote sensing data used for this study, and does not necessarily reflect their morphology on the ground. Wherever possible, ground truth data was used to modify information on the apparent form of these sites (and where this is the case, this is mentioned in Section 4), but this was not always available. However, in all cases the secondary purpose of the classification system presented here was fulfilled: to create a typology usable by researchers primarily investigating this region using remote sensing methods.

4. Results: A typology for "Kranzhügel"

4.1. True Kranzhügel

This type is based on a strong similarity to Tell Chuera. The label *true Kranzhügel* distinguishes it from the generic use of the word discussed above, while still retaining the most widely-known term for these sites. Settlements in this category have:

a) a circular flattened conical high central mound;
b) a massive inner wall;
c) a concentric definite lower town (with an undulating surface indicative of structures) on a clear lower terrace, i.e. at a level above the height of the surrounding landscape;
d) an outer wall equally or more massive than the inner one (Fig. 4).

The lower towns of these sites are relatively narrow, with their width comprising at most 55% of a site's total radius, with an average of 41%. The course of the outer wall, and thus the overall shape, of a *true Kranzhügel* is not necessarily circular, though it is at least sub-circular, as

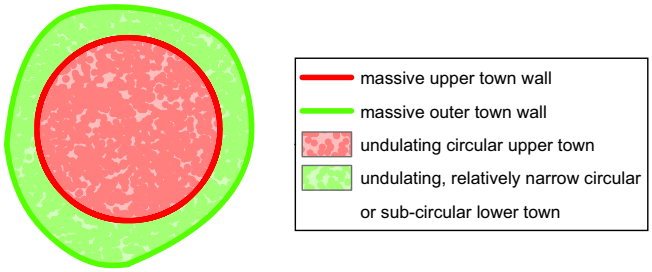

Fig. 4. Simplified representative sketch of the core features that typify the appearance of a *true Kranzhügel* on remote sensing data.

[7] For a more general classification encompassing all fortified Bronze Age sites in Northern Mesopotamia and the Levant, see Rey (2012).

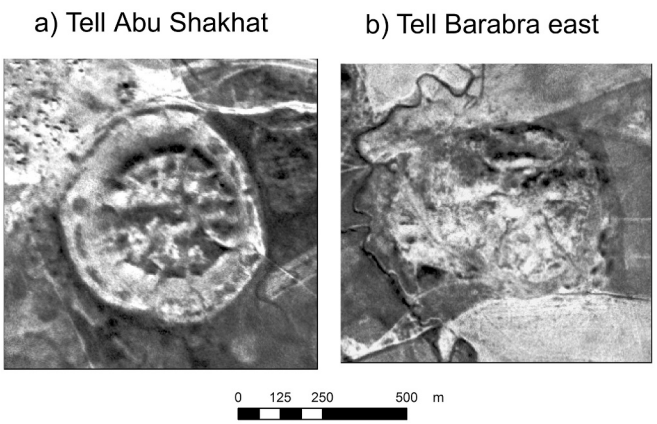

Fig. 5. Examples of characteristic *true Kranzhügel* on CORONA satellite imagery. For a detailed explanation of why Tell Barabra East, which is not usually considered amongst the "Kranzhügel" sites, fits this descriptor, see Smith (2015a: 179–180).

opposed to polygonal (see Fig. 5). Many of these characteristics have been noted on the ground at numerous sites in this category, and all have been determined by excavation at Tell Chuera. The developmental history of Chuera's upper and lower towns, and inner and outer walls (see Section 2), potentially applies to every *true Kranzhügel*, though this cannot be demonstrated without further archaeological investigation on the ground.

4.2. Ringwall settlement

Sites of this category, named after their most prominent feature, are typified in the GWJ by Khirbet Malhat and Tell Mu'azzar (Fig. 7), however are also represented by the better-investigated Tell Beydar. They comprise:

a) a circular or rounded polygonal flattened central mound;
b) a barely identifiable, sometimes seemingly nonexistent inner wall (but see below);
c) a concentric "lower town" area that is flat, generally featureless, and on an extremely low (if any) terrace;
d) a very clear massive outer wall, often with distinct gaps that are likely city gates (Fig. 6).

Compared to the *true Kranzhügel*, the "lower towns" of *ringwall settlements* are mostly relatively wider, with the broadest making up 63% of the total radius of a site, with 55% being the average. The outline shapes of the upper and lower towns are mostly complementary, and are largely rounded polygons, with examples of hexagonal, pentagonal, and square variations.

Excavations at Tell Beydar and surveys at Khirbet Malhat indicate that despite being hardly visible on remote sensing data, *ringwall settlements* probably did feature inner walls and occupation of their lower towns. At the former site, the inner wall is well documented, while as discussed in Section 2 the lower town was occupied for a few centuries. At Khirbet Malhat, though the site was founded in EJZ 0/1, the lower town was only occupied from ca. EJZ 2 to the site's abandonment in late EJZ 3b, and its structures only became apparent after a geophysical survey was conducted (Quenet and Sultan, 2020). Thus, both sites' lower towns have different developmental histories, yet share the fact that they were not occupied intensively, and for a relatively short time period, perhaps explaining their apparent absence on satellite imagery. A further explanation proposed by Bretschneider (2005: 55) is that rather than containing permanent structures, the lower towns of sites like Beydar might primarily have been the locations of temporary camps for traders, who were "[very likely] allowed to spend the night between

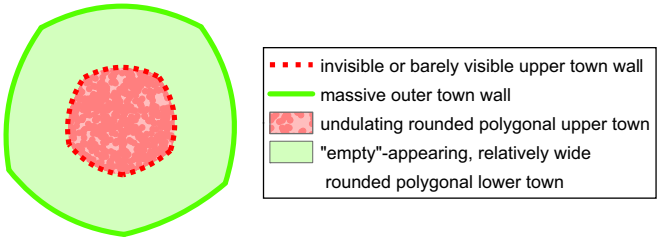

Fig. 6. Simplified representative sketch of the core features that typify the appearance of a *ringwall settlement* on remote sensing data.

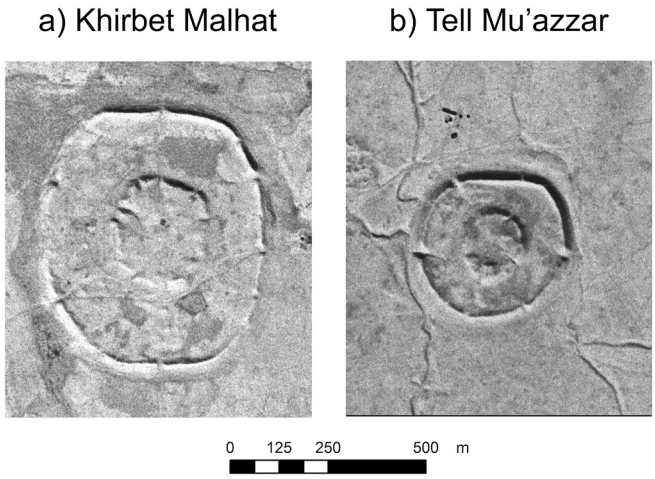

Fig. 7. Examples of characteristic *ringwall settlements* on CORONA satellite imagery.

the two walls, safe from highway robbers but not themselves posing a danger to the sleeping citizens of [the settlement]".

4.3. Dakhliz-variety tell

These sites are typified by Tell Dakhliz as well as the nearly identical Tell Glai'a (Fig. 9). Their main characteristics are:

a) an upper town identical to that of a *true Kranzhügel* (flattened circular conical high central mound with a massive surrounding wall);
b) a concentric circular lower town with a clear undulating surface on no clear terrace;
c) no trace of any outer wall enclosing the lower town (Fig. 8).

It is of course feasible that originally present outer walls are no longer visible on remote sensing data, or even by ground survey, due to past destruction, taphonomic processes, or modern land use. However, while this is a possibility that must be considered for *Dakhliz-variety* tells

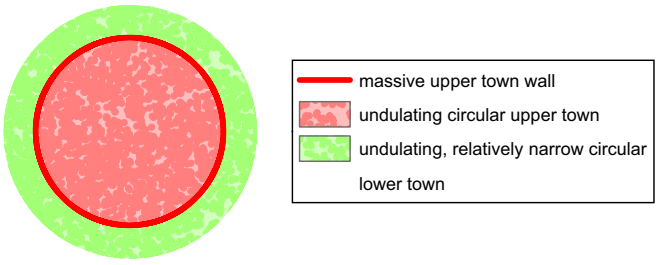

Fig. 8. Simplified representative sketch of the core features that typify the appearance of a *Dakhliz-variety* tell site on remote sensing data.

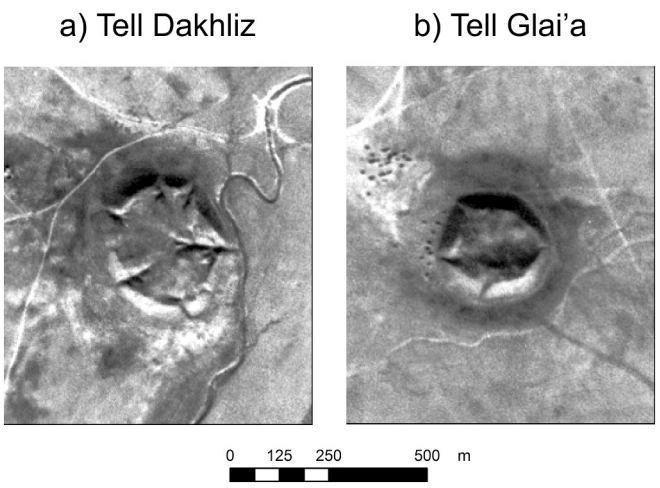

Fig. 9. Examples of characteristic *Dakhliz-variety* tells on CORONA satellite imagery.

in general, based on an intensive site survey it is almost certainly not the case at Tell Dakhliz. Despite heavy erosion on its eastern side due to a wadi, this site was found to be largely intact to the north, west, and south, with a clearly discernible upper town, single wall, and lower town, but no evidence for an outer wall, or indeed any topographic footprint thereof (Kudlek, pers. comm. 16/05/2014). The area occupied by these features was not found to be subject to a greater intensity of subsequent land use than that of other sites in the region which have clear evidence for outer walls, such as Tell Abu Shakhat. Furthermore, the cultivation which is present does not vary in intensity between the area of the clearly visible "inner" wall and the area where an outer wall would be expected. Additionally, its lower town is clearly apparent both on the ground and on remote sensing data. Thus it is very unlikely that a more massive EBA structure in almost exactly the same place would have become completely invisible (Kudlek, pers. comm. 20/05/2015). Tell Dakhliz is therefore a testament to the fact that two-tiered fortified tells with unfortified lower towns existed in the GWJ in at least one instance, and should therefore be considered a valid option for interpreting other sites that appear very similar on remote sensing.

Given this, such settlements are perhaps best interpreted as "unfinished" *true Kranzhügel*. That is to say they likely underwent the initial establishment of an ordinary tell with an enclosing wall as verified at Tell Chuera, subsequently expanding into a concentric lower town in the same way. However, they never saw the construction of an outer wall. Amongst other things, this could indicate a lack of necessity of constructing such a fortification or that the occupation of the lower town was short-lived.

4.4. Matin-variety tell

The use of the term "two-tiered fortified tell" as a universal descriptor for sites which have been called "Kranzhügel" requires the inclusion of a new category of GWJ sites which have never been given this moniker in the past, included here for the sake of completeness. These sites, the most prominent example of which is Tell Matin (Fig. 11a), are the least well-known of the categories, with none having been studied in detail, let alone excavated. Their main characteristics are:

a) a small conical central or off-centre high mound with no trace of an encircling wall;
b) a large, sprawling concentric lower town with a clear undulating surface on no clear terrace;
c) a surrounding lower town wall of varying clarity (Fig. 10).

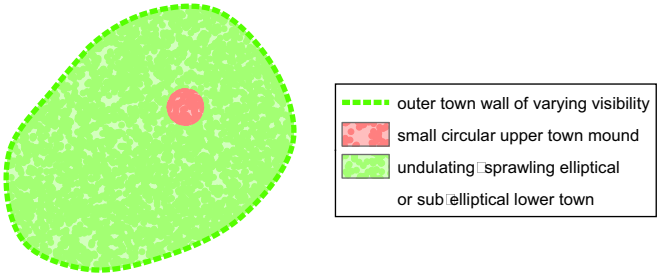

Fig. 10. Simplified representative sketch of the core features that typify the appearance of a *Matin-variety* tell site on remote sensing data.

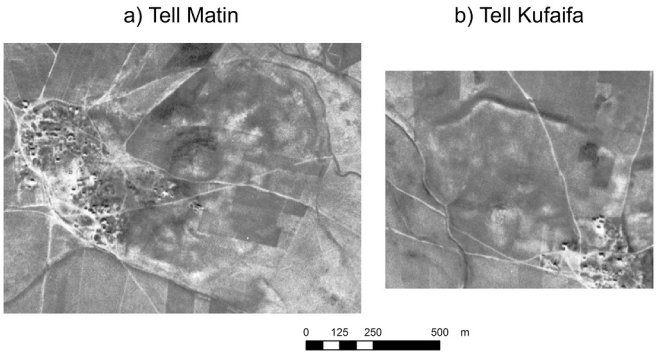

Fig. 11. Examples of characteristic *Matin-variety* tells on CORONA satellite imagery.

The appearance of these sites is rendered particularly distinctive by the small size of the central mound (never measuring more than 2.3 ha) and the relative vastness of the lower town, comprising between 87% and 95% of the width of each site's radius. The lack of a clear "inner wall" may well not be an accurate reflection of the original morphology of these settlements, as a conical mound shape can itself be an indication of an initially-present wall (see Lawrence, 2012: 145–146). However, it is safe to say that these would not have been the massive ramparts found at other types of two-tiered fortified tells. The outer wall of *Matin-variety* tells is mostly only faintly visible, though it sometimes appears prominently (see Fig. 11b). Whether less substantial constructions compared to those at *true Kranzhügel* and *ringwall settlements* or geomorphological processes are responsible for this is unclear. The shape of this outer boundary varies, but is mostly either elliptical or sub-elliptical.

5. Discussion and ramifications

This typological definition of two-tiered fortified tells, and the associated disentangling of the term "Kranzhügel" from both very narrow and very broad definitions, allows an objective picture of these settlements to be formed. This has several ramifications, the first of which is that contrary to the claims of Meyer (2010b) and others, their geographical distribution definitely stretches beyond the boundaries of the Balikh and Khabur rivers (Fig. 12; Table 2). They appear, however, to remain a phenomenon of the north Syrian steppes, though as the study that gave rise to the proposed typology focussed on the GWJ, it is not yet known to how many further sites it may be applicable. Second, this typology enables both a narrowing and a broadening of the corpus of this site type. Certain sites that have previously been called "Kranzhügel" definitely do not fit into any two-tiered fortified tell category,

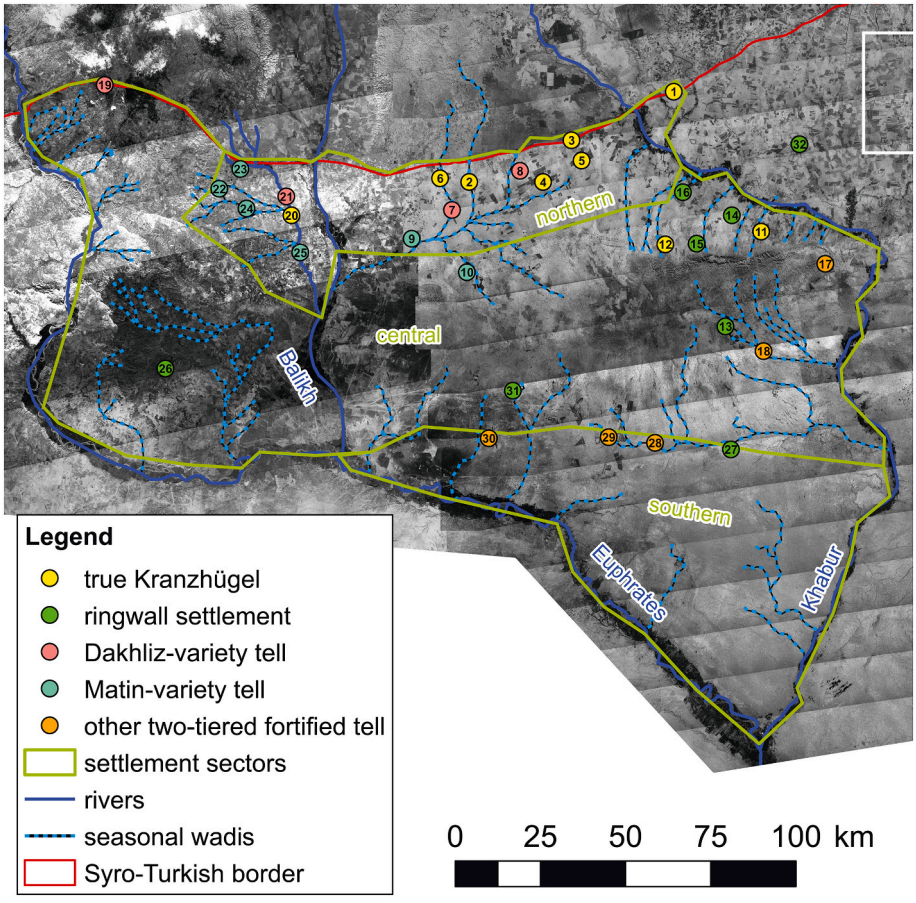

Fig. 12. CORONA satellite map of the GWJ showing all two-tiered fortified tells investigated by the remote sensing survey, plus Tell Beydar. Numbered sites correspond to Table 2.

Table 2
Table of all two-tiered fortified tells investigated by the remote sensing survey, plus Tell Beydar.

Number on Fig. 12	Name	Size (ha)	Two-tiered fortified tell category	Co-ordinates (UTM 37 N)	Main data source(s) other than remote sensing	Page number(s) for detailed description in Smith, 2015a
1	Tell Chanafes	141	true Kranzhügel	604785 E, 4082255 N	von Oppenheim, 1943	262–264
2	Tell Chuera	68	true Kranzhügel	544772 E, 4055769 N	Meyer, 2010; Helms and Quenet, 2020	239–240
3	Tell Khanzir	40	true Kranzhügel	574772 E, 4068026 N	Moortgat-Correns, 1972; Kühne and Schneider, 1988	265
4	Tell Abu Shakhat	31	true Kranzhügel	566446 E, 4055731 N	Moortgat-Correns, 1972; Kühne and Schneider, 1988	266–267
5	Tell Bogha	22	true Kranzhügel	577767 E, 4062030 N	Moortgat-Correns, 1972	267–268
6	Tell Ghajar al-Kebir	20	true Kranzhügel	536243 E, 4056816 N	Kühne and Schneider, 1988; Kudlek, 2006	241
7	Tell Dakhliz	23	Dakhliz-variety tell	539742 E, 4047529 N	Kühne and Schneider, 1988; Pruß, 2005; Kudlek, 2006; Hempelmann, 2013	242
8	Tell Glai'a	18	Dakhliz-variety tell	559712 E, 4059008 N	none	271
9	Site 959	3	Matin-variety tell	527913 E, 4039068 N	none	270
10	Site 991	4	Matin-variety tell	544079 E, 4029240 N	none	269
11	Tell Mabtuh Sharqi	44	true Kranzhügel	630481 E, 4041151 N	Moortgat-Correns, 1972; Kühne and Schneider, 1988; Kouchoukos, 1998; Gernez and Souleiman, 2013	207–208
12	Tell Mabtuh Gharbi	28	true Kranzhügel	602330 E, 4037434 N	Moortgat-Correns, 1972; Kühne and Schneider, 1988; Kouchoukos, 1998	209
13	Tell Mu'azzar	14	ringwall settlement	619970 E, 4013314 N	Moortgat-Correns, 1972; Kühne and Schneider, 1988; Preuss, 1989; Kouchoukos, 1998	213
14	Tell Hamam Sharqi	16	ringwall settlement	621855 E, 4045952 N	Kouchoukos, 1998	210
15	Tell al-Magher	13	ringwall settlement	611553 E, 4037608 N	Moortgat-Correns, 1972; Kühne and Schneider, 1988; Kouchoukos, 1998	212
16	Site 34	5	ringwall settlement	607504 E, 4052735 N	Kouchoukos, 1998	211
17	Tell Barud	3	other	649297 E, 4031688 N	Preuss, 1989; Kouchoukos, 1998	218
18	Tell Mityaha	3	other	631159 E, 4006080 N	Moortgat-Correns, 1972; Preuss, 1989; Kouchoukos, 1998	214
19	Tell Sha'ir [Sarugh]	15	Dakhliz-variety tell	437823 E, 4084275 N	Einwag, 1993	186
20	Tell Barabra East	26	true Kranzhügel	492649 E, 4045936 N	Córdoba, 1988; Einwag, 1993, 2000	179–180
21	Tell Marrak	17	Dakhliz-variety tell	491092 E, 4051475 N	Córdoba, 1988	187
22	Tell Matin	63	Matin-variety tell	471425 E, 4053731 N	Einwag, 1993, 2000	182
23	Koberlik	25	Matin-variety tell	477630 E, 4059584 N	Einwag, 2000	184
24	Tell Kufaifa (Kur Kahiya)	34	Matin-variety tell	479423 E, 4047928 N	Einwag, 1993	183
25	Site 8	9	Matin-variety tell	495208 E, 4035022 N	none	185
26	Site 408	5 possibly up to 20	ringwall settlement	455604 E, 4000970 N	none	181
27	Khirbet Malhat	33	ringwall settlement	621602 E, 3977166 N	Moortgat-Correns, 1972; Kühne, 1983; Kühne and Schneider, 1988; Quenet and Sultan, 2020	274–275
28	Site 45	9	other	599338 E, 3979112 N	none	276
29	Tell Zahamak	10 possibly up to 50	other	585707 E, 3980779 N	Kouchoukos, 1998; Quenet and Sultan, 2020	277–278
30	Tell Sha'ir [Jazira]	21	other	550555 E, 3980453 N	Kouchoukos, 1998; Quenet and Sultan, 2020	278–279
31	Site 42	6 possibly up to 20	ringwall settlement	557595 E, 3994454 N	none	272
32	Tell Beydar	22	ringwall settlement	641712 E, 4066841 N	Pruß, 2013a	–

such as Tell Rawda (no terracing, no "lower town"). On the other hand, while the objections to the defining of Tell Beydar as a "Kranzhügel" are justified (it is not a *true Kranzhügel*), it remains a two-tiered fortified tell of the *ringwall settlement* type.

Third, the typology enables the defining of some broad distribution patterns, which, though still tentative, have bearings on environmental contexts, occupation periods, and functions of the sites. Within the GWJ, three "sectors" of two-tiered fortified tells can be identified (Fig. 12),

defined by the locational clustering of specific site types and correlating with hydro-topographic variations. The *northern sector* receives between 240 and 350 mm annual precipitation and is centred on the level, seasonally-watered plains around the watercourses of the Qaramukh, upper Balikh, Wadi Hamar, and upper Khabur. Its two-tiered fortified tells are predominantly large *true Kranzhügel* (47% of the corpus, $n = 7$; measuring 20–141 ha) and small-to-large *Matin-variety* tells (33%, $n = 5$; 3–63 ha), with three *Dakhliz-variety* tells. The *central sector* (210–380 mm annual rainfall) is defined by mountainous upland and piedmont slopes, watered less reliably by surface runoff, with precipitation on the uplands collecting in shallow seasonal lakes and charging localised gypsum aquifers (Kouchoukos, 1998: 383–386). Medium-to-large *ringwall settlements* (50% of the corpus, $n = 6$; measuring 5–16 ha) dominate the two-tiered fortified tells here, though two large *true Kranzhügel* (28 and 44 ha) are also present, as well as a handful of others. The *southern sector* (140–210 mm annual rainfall) consists of a mostly uniform flat steppe landscape and only a handful of medium-to-large two-tiered fortified tells along its northern edge (9–33+ ha), 75% of which ($n = 3$) are not categorisable by the typology.

These "sectors" in turn relate to patterns of settlement occupation. Based on the results of the Wadi Hamar Survey (Hempelmann, 2013: 187–193, 271–276; Kudlek, 2006), it can be extrapolated that the *true Kranzhügel* and *Dakhliz-variety* tells of the *northern sector* were established from EJZ 0 onwards, indicating a continuation of urban settlement at a time when the general trend in Northern Mesopotamia was one of settlement dispersion in the wake of the collapse of the Uruk expansion (Hempelmann, 2020; Smith, 2020a, 2020b; Ur, 2010). The predominant *ringwall settlements* of the *central sector*, on the other hand, do not appear to have been urban settlements until EJZ 3a, possibly as a result of the establishment of major economic polities such as Mari (Ville II) and Ebla, which by this time had emerged in the region's more fertile regions (Ur, 2010), moving into the steppe to exploit the empty space for sheep holdings and limited agriculture (Hole, 1997: 52–56; Kouchoukos, 1998: 410–423; Smith and Wilkinson, 2020). Although Khirbet Malhat was already occupied during EJZ 0/1, it is likely that the main period of flourishing of the two-tiered fortified tells along the north of the *southern sector* is also from EJZ 3a onwards, as their east-west alignment at roughly one day's journey apart make it probable that they owe their existence to the emerging trade routes of the mid-late EBA (Quenet and Sultan, 2020; Smith, 2020a; Smith and Wilkinson, 2020; Smith et al., 2014). A similar variation exists regarding the decline of EBA settlements in the region, with those of the *southern* and *central sectors* becoming abandoned during the course of EJZ 4b (Kouchoukos, 1998: 435–438), while similar processes are not visible in the archaeological record of the *northern sector* until the very end of EJZ 4b, with the majority occurring during EJZ 4c (Meyer, 2010b; Pruß, 2013b). This is likely the result of a combination of factors, including the underlying element of increasingly arid climate conditions during the late 3rd millennium BCE affecting areas of lower average precipitation first (Kalayci, 2013: 99–112) and the more direct catalyst of the Akkadian Empire, which arguably exerted a direct control that disrupted trade routes and shut down opportunities for local economies to operate independently, encroaching northwards over a period of at least several decades (Kouchoukos, 1998: 435–436; see also Michalowski, 1993 and Ur, 2010: 407–412 for discussions).[8]

6. Conclusions

It is evident, therefore, that this typological categorisation of the various "Kranzhügel" sites not only disentangles very different settlements from this homogeneously applied descriptor, but also enables the forming of accurate new interpretations of regional settlement dynamics. Since the proposed two-tiered fortified tell categories correlate not only with site morphologies, but also with geographical distribution and occupation periods, they can greatly aid holistic studies of these sites and their environments, particularly those carried out by remote sensing. This, in turn, illustrates the variety of paths towards urbanism in Northern Mesopotamia, and that an overall "collapse" of urban settlement following the end of the Uruk expansion did not occur uniformly in all locations, providing further details on the regional patterns discussed by Wilkinson et al. (2014). More broadly, this study showcases the benefits of re-examining fieldwork published in a variety of languages, extrapolations made from limited datasets, and also of incorporating remote sensing data. It is clearly imperative to conduct such reviews of existing results to ensure a solid basis upon which to conduct any further research, both in the field and from a distance.

[8] For a detailed breakdown of the significant chronological events and processes of the GWJ during the EBA, see Smith, 2015a: 376–390.

CrediT author statement

The single author was responsible for all aspects related to the conceptualisation, methodology, formal analysis, investigation, writing – original draft, writing – review & editing, visualization, project administration, and funding acquisition for the production of the manuscript.

Declaration of Competing Interest

The author declares no conflict of interest. The funding sponsors had no role in the design, execution, interpretation, or writing of the study.

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